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ULCER DISEASE IN TROUT

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INTRODUCTION

Ulcer disease is of great economic importance in the northeastern United States and eastern Canada. This disease should not be confused with "red sore" disease of pike which is apparently caused by a different bacterium.

IDENTIFICATION

As its name indicates, ulcer disease is characterized by shallow open sores or ulcers on the surface of the body. Occasionally furuncles are formed which resemble the lesions present in furunculosis and may be confused with it. The disease starts in the early stages as small whitish pimples or "tufts" resembling small patches of fungus, which can be found on almost any part of the body. Frequently the jaws and roof of the mouth become infected and are eroded away. The small pimples or tufts develop into small circular shallow ulcers, usually red, which increase in size and sometimes combine to form a large irregular lesion. Lesions may occur on the fins which then become frayed and the tissue between the fin rays is destroyed. In extremely acute cases the external symptoms may be absent, but the bacterium can be found in the kidney.

The only reliable method of diagnosis of the disease is by bacteriological examination. Bacteriological diagnosis is further important because quite often ulcer disease and furunculosis occur together as mixed infections. Other fish diseases in which external ulcerations occur can be caused by pseudomonad-like bacteria and are described in a leaflet entitled "Fish Diseases Caused by Bacteria Belonging to the Genera Aeromonas and Pseudomonas."

CAUSE OF THE DISEASE

Hemophilus piscium has been identified as the causative agent of ulcer disease in trout. It is a non-motile, gram negative bacterium which grows on media enriched with fish-tissue extracts, fish peptone, pure hemin with cocarboxylase or adenosine triphosphate.

SOURCE AND RESERVOIR OF INFECTION

Adult fish may frequently act as carriers of the bacterium. Where active infection is present, the open ulcers and the feces of fish in which the disease has reached the septicaemic stage may act as sources.

MODE OF TRANSMISSION

Through water or food contaminated by bacteria present in water or feces.

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West Virginia.

INCUBATION PERIOD

10 days to 2 weeks at 13° C (55° F).

PERIOD OF COMMUNICABILITY

Adult fish resistant to the disease probably act as carriers indefinitely.

SUSCEPTIBILITY AND RESISTANCE

Ulcer disease is primarily an infection of brook trout, but brown and lake trout are also susceptible. Rainbow trout are resistant to the disease, but not immune. The susceptibility of brook trout seems to decrease with age.

RANGE

According to L. E. Wolf, this disease will not break out below 7° C (45° F). Geographically is limited to the northeastern America.

OCCURRENCE

In eastern brook trout in hatcheries in the northeastern part of the United States and eastern Canada.

METHODS OF CONTROL

A. Preventive measures.

Preventive measures are much more important than treatments. They are as follows:

a. Disinfection of fish eggs.
b. Elimination of carriers from the hatchery water supply.
c. Whenever there is any recent history of this disease in a hatchery all utensils must be disinfected after each use.
d. Water used for fry and fingerling fish must not be inhabited by any fish.
e. If the hatchery had recent outbreaks of ulcer disease, only strains of trout most resistant to this disease should be raised.

B. Therapy.

Sulfonamides in general are not effective in controlling ulcer disease, but in cases where fish are somewhat resistant to the disease, they may be of some help. The antibiotics chloramphenicol and Terramycin are very effective in the treatment of ulcer disease. These are given orally mixed with food at the rate of 2.5 to 3.5 grams of pure antibiotic activity per 100 pounds of fish per day. The treatment should be continued until the epizootic is brought completely under control. This should be achieved after 10 to 15 days, provided that treatment is started soon enough.

ANNOTATED BIBLIOGRAPHY

The most recent papers on ulcer disease are listed here. Many early papers were written on ulcer-like conditions found in various species of fish, but do not pertain to the ulcer disease in trout as it is described today and caused by the bacterium Hemophilus piscium.

* Davis, H. S.
1953. Culture and Diseases of Game Fishes. University of California Press, Berkeley, Cal. Ulcer disease pp. 255-258.
A presentation of the symptoms, pathology and control measures of the disease.

Fish, Frederic F.
1934. Ulcer Disease of Trout. Trans. Am. Fish. Soc., Vol. 64, pp. 252-258.
An effort to isolate the causative agent of ulcer disease is presented with detailed symptoms and pathology of the disease. Bacteria other than Hemophilus piscium were sometimes isolated from the diseased fish.

Margolis, L.
1954. Ulcer disease and furunculosis in a Quebec trout hatchery. The Canadian Fish Culturist, No. 15, pp. 16-17.

This is the first report of ulcer disease in Canada. It was a mixed infection with furunculosis. Hemophilus piscium and Aeromonas (Bacterium) salmonicida were isolated and identified.

* Snieszko, S. F.
1952. Ulcer disease in brook trout (Salvelinus fontinalis): Its economic importance, diagnosis, treatment and prevention. Prog. Fish-Cult., Vol. 14, pp. 43-49.
A complete history, description and diagnosis of the disease in brook trout with the most recent methods of treatment and prevention.

Snieszko, S. F. and S. B. Friddle
1950. A contribution to the etiology of ulcer disease of trout. Trans. Am. Fish. Soc., Vol. 78, pp. 56-63.
A description of ulcer disease in brook trout with the characteristics of the bacterium causing the disease. The methods of isolation and cultivation on media prepared with trout tissue extract are described. Results of experiments conducted with brook, brown and rainbow trout inoculated with the bacterium are presented.

Snieszko, S. F., P. J. Griffin and S. B. Friddle
1950. A new bacterium (Hemophilus piscium n. sp.) from ulcer disease of trout. Jour. Bact., Vol. 59, pp. 699-710.
A description and the methods of isolation and culture of the bacterium causing ulcer disease in trout.

* 1952. Antibiotic treatment of ulcer disease and furunculosis in trout. Trans. N. Am. Wildl. Conf., Vol. 17, pp. 197-213.
Data are presented on experiments using terramycin, aureomycin and chloramphenicol fed orally to brook trout. Good control of the disease was obtained with chloramphenicol and terramycin. The use of antibiotics in fish disease treatment is discussed.

Wolf, Louis E.
1939. Observations on ulcer disease of trout. Trans. Am. Fish. Soc., Vol. 68, pp. 136-151.
Detailed description of the symptoms. Brook trout most susceptible, brown trout less and rainbow trout most resistant. None of the external treatments or internal including sulfanilamide had any beneficial effect. Different diets or addition of vitamins also had no effect.

1941. Further observations on the ulcer disease of trout. Trans. Am. Fish. Soc., Vol. 70, pp. 369-381.
Unsuccessful attempts to treat ulcer disease are presented.

* 1947. Sulfamerazine in the treatment of trout for furunculosis and ulcer disease. Prog. Fish-Cult., Vol. 9, pp. 115-124.
Attempts to check two diseases of trout by oral administration of sulfamerazine to brook, brown and lake trout infected with these diseases are described. Results obtained from these experiments indicated that the drug checked both diseases. Other investigators found that treatment with sulfonamides is not effective. Therefore some special conditions must have existed which made such treatment effective.

* Papers indicated by an asterisk are of special importance to fish culturists.

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